UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Alaska Fisheries Science Center
Resource Assessment and Conservation Engineering Division
7600 Sand Point Way Northeast
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Seattle, Washington 98115-0070

March 16, 2000 F/AKC2:MG

Cruise Announcement

Cruise MF2000-04 NOAA Ship *Miller Freeman*

Echo Integration-Trawl Survey of Walleye Pollock in Shelikof Strait, Gulf of Alaska

Scientists from the Alaska Fisheries Science Center (AFSC) will conduct an echo integration-trawl (EIT) survey of walleye pollock (*Theragra chalcogramma*) while aboard the NOAA ship *Miller Freeman* March 15-28, 2000 for a total of 14 sea days. The cruise will begin in Dutch Harbor, Alaska and end in Kodiak, Alaska. The area of operation is the Shelikof Strait area (Fig. 1).

VESSEL ITINERARY

Mar 15	Embark scientists in Dutch Harbor, AK. Depart at 1500
Mar 16	Transit to survey start location near Chirikof Island
Mar 16-27	EIT survey of Shelikof Strait area
Mar 27-28	Conduct sphere calibration; transit to Kodiak, AK
Mar 28	Disembark scientists; end of cruise

OBJECTIVES

The principal objectives of the cruise are to:

1. collect echo integration data and midwater and bottom trawl data necessary to determine the distribution, biomass, and biological composition of walleye pollock in the Shelikof Strait area;

2. collect pollock target strength data using hull-mounted and lowered transducers for use in scaling echo integration data to estimates of absolute abundance;

3. calibrate the 38-kHz and 120-kHz scientific acoustic systems using standard sphere techniques;

4. collect physical oceanographic data including temperature and salinity profiles at selected sites, and conduct continuous monitoring of sea surface parameters (e.g., temperature, salinity) and water current profiles; and

5. collect acoustic data from an acoustic buoy to determine the distribution and behavioral response of walleye pollock to ship and trawl noise.

Secondary objectives of the cruise are to spawn mature walleye pollock and culture the fertilized eggs for laboratory experiments on eggs and larvae; collect samples of pollock ovary tissue for studying the interannual variation in fecundity; monitor pollock behavior within the net using a self-contained camera system; collect and preserve whole stomachs from walleye pollock, Pacific cod (*Gadus macrocephalus*), and arrowtooth flounder (*Atheresthes stomias*); and collect and preserve walleye pollock DNA tissue samples from fins, heart, liver, and muscle tissue.

METHODS

Survey operations will be conducted 24 hours per day. Acoustic data will be collected continuously along a series of parallel transects with an EK500 echo integration system incorporating two centerboard-mounted transducers operating at 38 kHz and 120 kHz, respectively. Parallel transect spacing planned for the survey of the Shelikof Strait area will be either 7.5 or 3.75 nm. Ship speed is expected to average 12 knots in favorable weather conditions. Trawl hauls will be conducted at any time based on occurrence of echosign. About 2-3 trawl hauls per 24-hour period are anticipated, although more frequent trawl sampling may occasionally be required. Midwater and bottom trawl hauls will be made to identify selected echosign and provide biological data and samples of pollock. Haul durations will be long enough to collect an adequate sample. Biological data collected from each haul will usually include species and sex compositions, length frequencies, whole fish and ovary weights, gonad maturities, and otoliths from selected species. Conductivity-temperature-depth (CTD) data may

be collected with an AFSC Seabird SeaCat system at trawl locations and at other selected locations.

Pollock target strength data will be collected on an opportunistic basis. Certain conditions (i.e., low fish densities, single species, and unimodal size composition) are required for this work to be successful. Collection of target strength data typically involves repeated passes over an aggregation of fish at a vessel speed of approximately 3-5 knots. One or two trawl hauls are made to provide species composition and biological data. Whenever calm seas are encountered along with the above-mentioned conditions, a second approach at collecting target strength data may be attempted. With the vessel stopped, a 38-kHz transducer will be lowered to a depth just above the fish sign for data collection using the lowered-transducer winch assembly.

A standard sphere calibration of the centerboard-mounted scientific acoustic systems (38 kHz and 120 kHz) will be conducted at the end of the cruise at a location to be determined. This work requires anchoring the vessel at the stern and bow, then suspending a calibration sphere assembly directly beneath the vessel's centerboard. A CTD cast will be conducted at this site.

A buoy filled with echosounding equipment will be deployed and recovered during the survey on an opportunistic basis. The duration that the buoy will be at liberty will vary between 2-6 h. After the buoy is released and the buoy's trajectory is determined, the vessel will steam 1-2 nm from the buoy, and maintain that distance until the scientist in charge notifies the bridge to begin free-running or trawling operations along a course that will take the vessel as close as possible past the buoy perpendicular to the buoy's trajectory. The vessel will continue steaming until 1-2 nm past the buoy.

SCIENTIFIC PERSONNEL

Name	Sex/ Nationality	Position	Organization
Michael Guttormsen	M/USA	Chief Scientist	AFSC
Chris Wilson	M/USA	Fish. Biologist	AFSC
John Horne	M/USA	Fish. Biologist	AFSC
Scott McEntire	M/USA	Fish. Biologist	AFSC
Denise McKelvey	F/USA	Fish. Biologist	AFSC
Steve de Blois	M/USA	Fish. Biologist	AFSC
Kevin Landgraf	M/USA	Fish. Biologist	AFSC
Bill Patton	M/USA	Fish. Biologist	AFSC
Phil Porter	M/USA	Computer Spec.	AFSC

AFSC - Alaska Fisheries Science Center, Seattle, WA

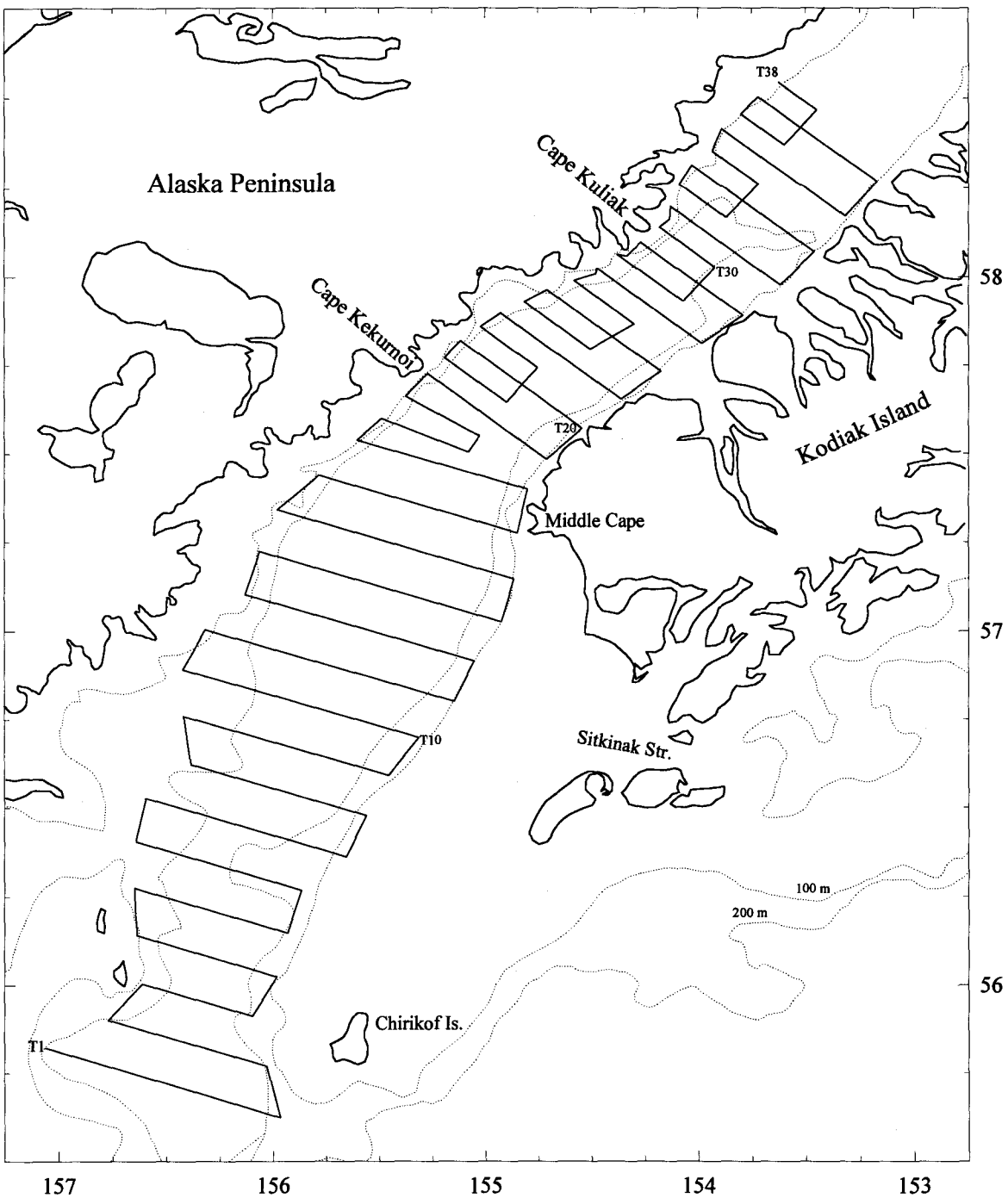

Figure 1. The proposed trackline for the 2000 Shelikof Strait area echo integration-trawl survey, MF2000-04.